Ned Davis Research Advisory

Minimizing Drawdowns Helps Long-Term Returns

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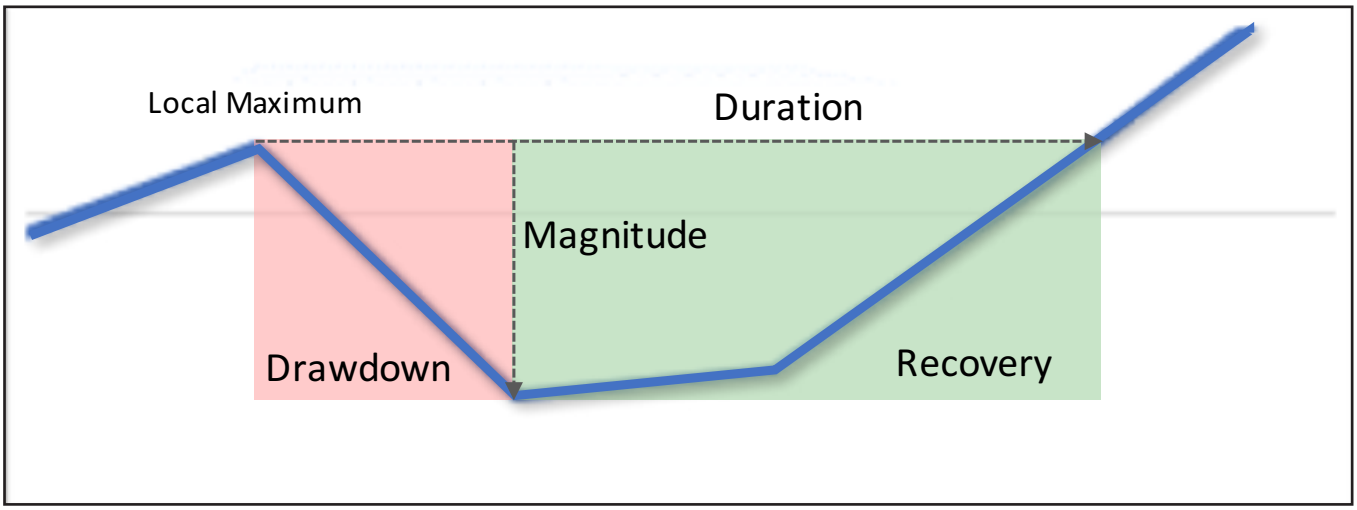
While financial plans may increasingly include 'capital preservation' as a primary goal while the baby boomer population ages, the reduction of drawdown can also be a powerful tool in maximizing long-term gains. Our own work on tactical asset allocation suggests that by avoiding periods of large drawdowns in a given asset class one can help produce benchmark-beating returns on less volatility, effectively boosting the portfolio's Sharpe Ratio. The idea that an investor can "win" by avoiding large drawdowns is an appealing strategy as markets become more competitive. In its most basic form, the "drawdown" metric aims to quantify the value lost from a historic high point to subsequent low point over a specific period. Equally as important, the "recovery" refers to the period immediately following the drawdown low point through the successive new high point. When properly applied, drawdown and recovery analysis can provide investors with a means to identify and compare downside risks and their likelihood of recurrence.

We explored historical drawdowns and evaluated their impact on long-term performance. The key takeaways of our analysis:

» Portfolios with larger maximum drawdowns tend to have lower risk-adjusted returns.

» More volatile markets tend to have larger maximum drawdowns.

» Active strategies that can reasonably reduce the worst few drawdowns result in significant gains.



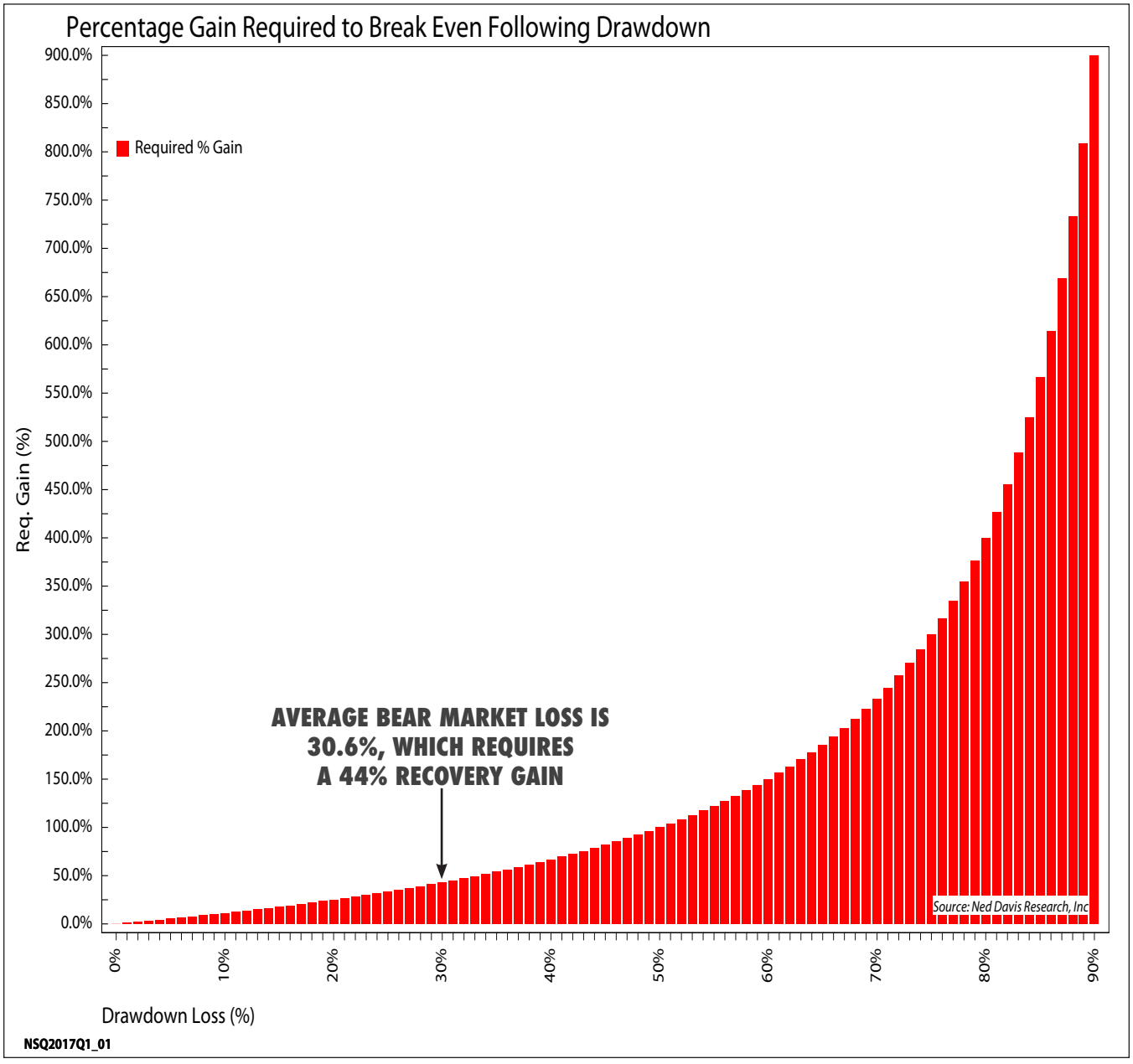
WHY -1% + 1% DOESN'T EQUAL 0%

One of the most common misconceptions associated with drawdown analysis is the relationship between the percentage loss during a drawdown and the performance required to recover. Consider a stock price that falls from $100 to $80, experiencing a 20% drawdown. While it is true that the dollar loss requires the exact dollar gain to fully recover, one might mistakenly think that the percentage loss also requires the same percentage gain to recover. In reality, the required percentage gain to recover is much greater – in this case, 25% [$100 – $80)/$80]. Investment percentage gains must be larger to offset the now smaller capital base.

This relationship between the percent lost and required percent gain can be summarized by the following equation:

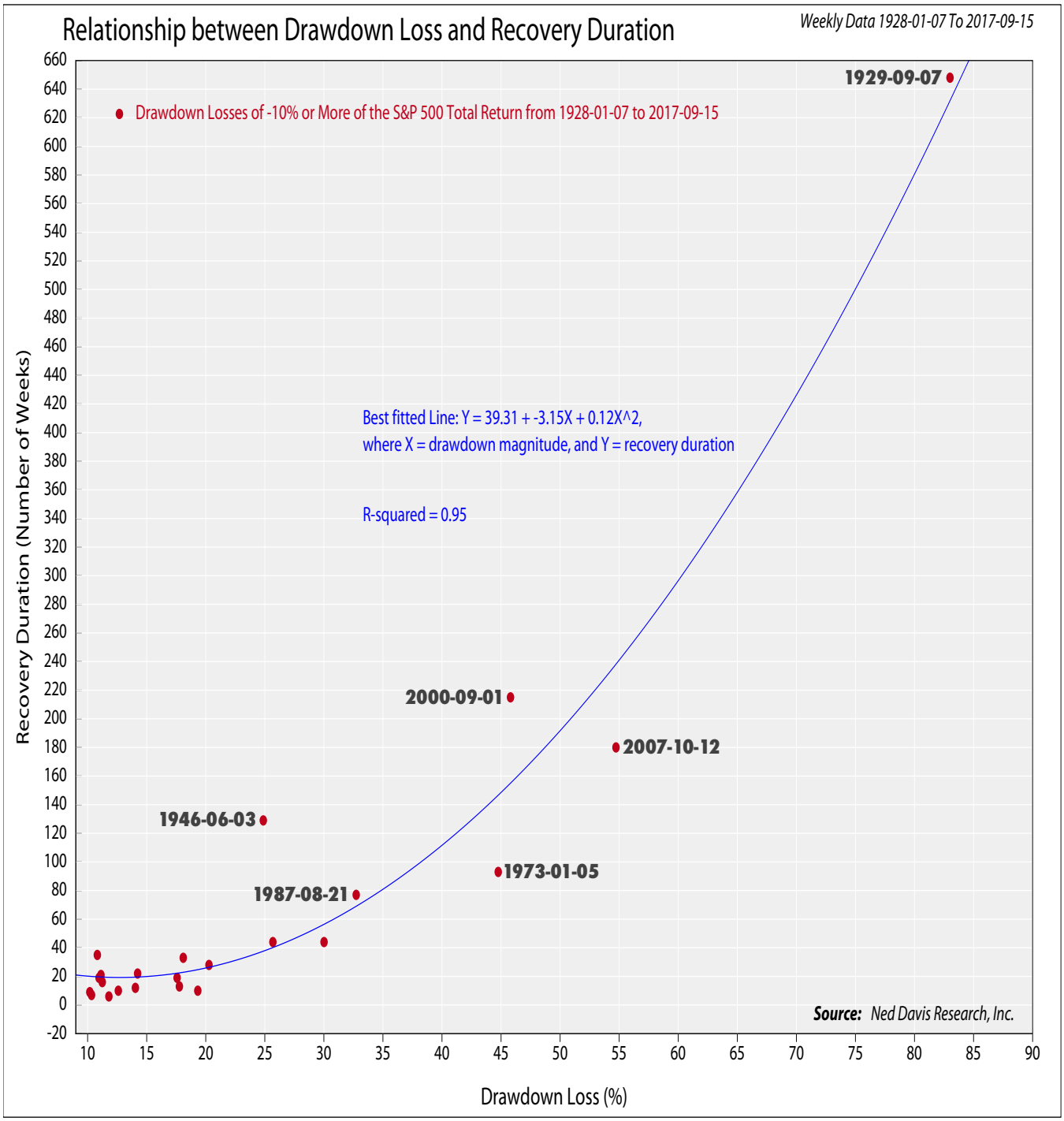
Recovery Gain (%) =
Drawdown Loss (%) / [100% - Drawdown Loss (%)]

The chart below illustrates the relationship between drawdown loss and recovery gain. When the drawdown is small, the difference between the recovery gain and drawdown loss is minimal. However, as the drawdown magnitude increases, the recovery gain increases at an increasing rate. The exponential nature of this relationship heavily penalizes portfolios that leave drawdowns unchecked.



After the required gain for recovery is known, the time to recover becomes the main concern. The chart below plots the relationship between observed S&P 500 drawdowns and their respective times to recover (duration). The analysis confirms the intuition that larger drawdowns also have longer recovery times. Similar to the recovery gain, the recovery duration increases at an accelerating rate as drawdown losses grow. However, as drawdown losses grow larger, the required recovery gain increases at a faster rate than the recovery duration, resulting in the characteristic "V-shaped" pattern. This is most noticeable for drawdown losses exceeding 70%.

No matter what magnitude the drawdown loss, both relationships reinforce the importance of drawdown reduction strategies in active portfolio management.



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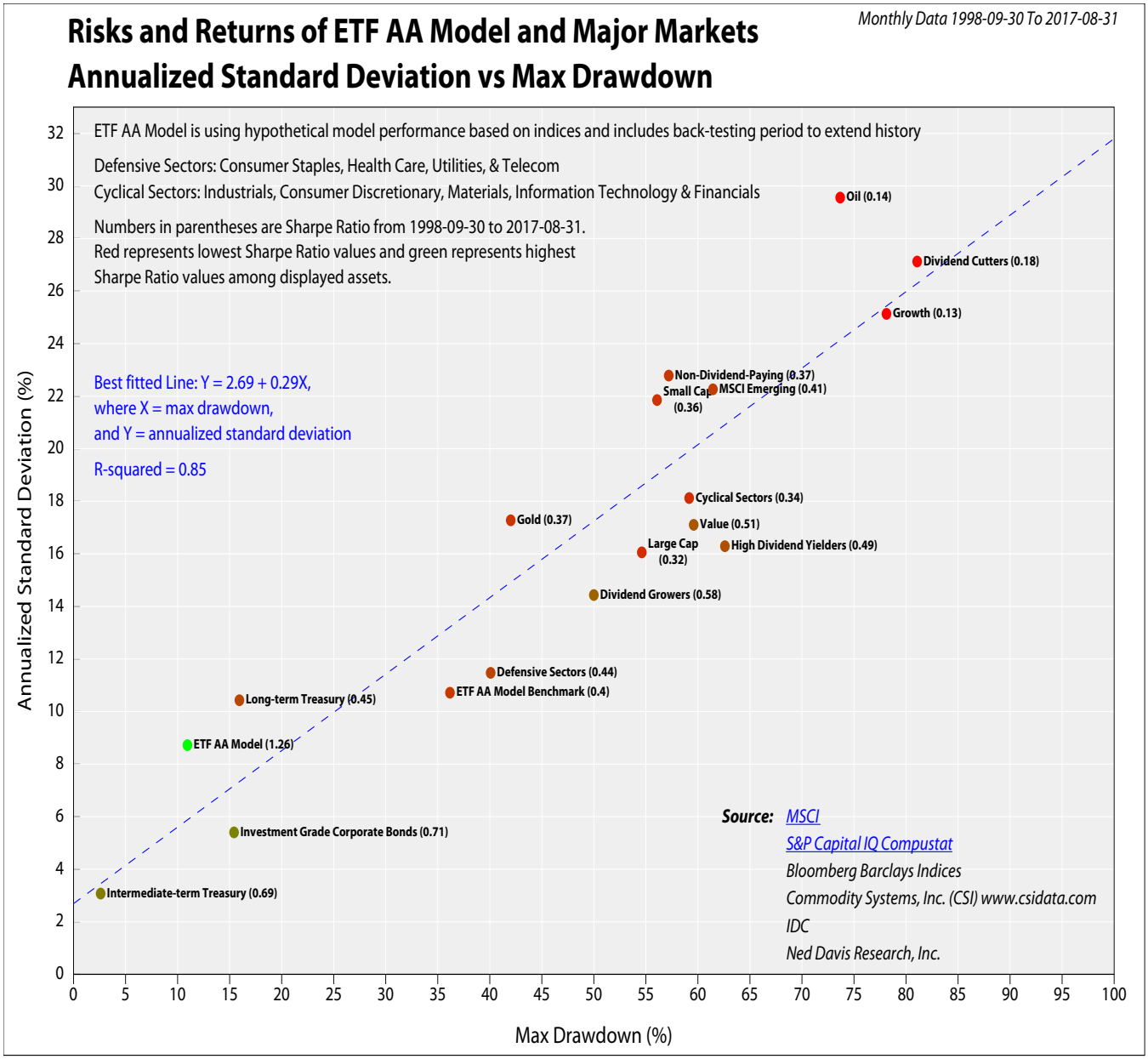
DRAWDOWNS AND VOLATILITY

While not directly linked, it is no surprise that the relationship between maximum drawdown and volatility is significant. To explore this relationship, we selected 18 different assets and compared their maximum drawdowns to their annualized standard deviations in the chart below. The regression line confirms a positive linear correlation between the two variables, volatility and drawdown, validating the intuition that more volatile markets tend to have larger maximum drawdowns.

The data point colors are representative of each asset's Sharpe ratio (risk-adjusted return) relative to the other assets. Green and red points represent the assets with the highest and lowest Sharpe ratios, respectively. Not surprisingly, higher Sharpe ratios tend to have lower maximum drawdowns and, as the maximum drawdown increases, the Sharpe ratio decreases. This suggests that on a risk-adjusted basis, maximum drawdowns are reasonable indicators of the portfolio return puzzle.

However, if the risk-adjustment aspect of the Sharpe ratio is removed, and the focus is put purely on returns, the assets with higher gains are not necessarily the assets with smaller maximum drawdowns. When comparing absolute returns to maximum drawdowns, the relationship becomes less consistent.



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DOES DEFENSIVE POSITIONING POTENTIALLY SACRIFICE UPSIDE?

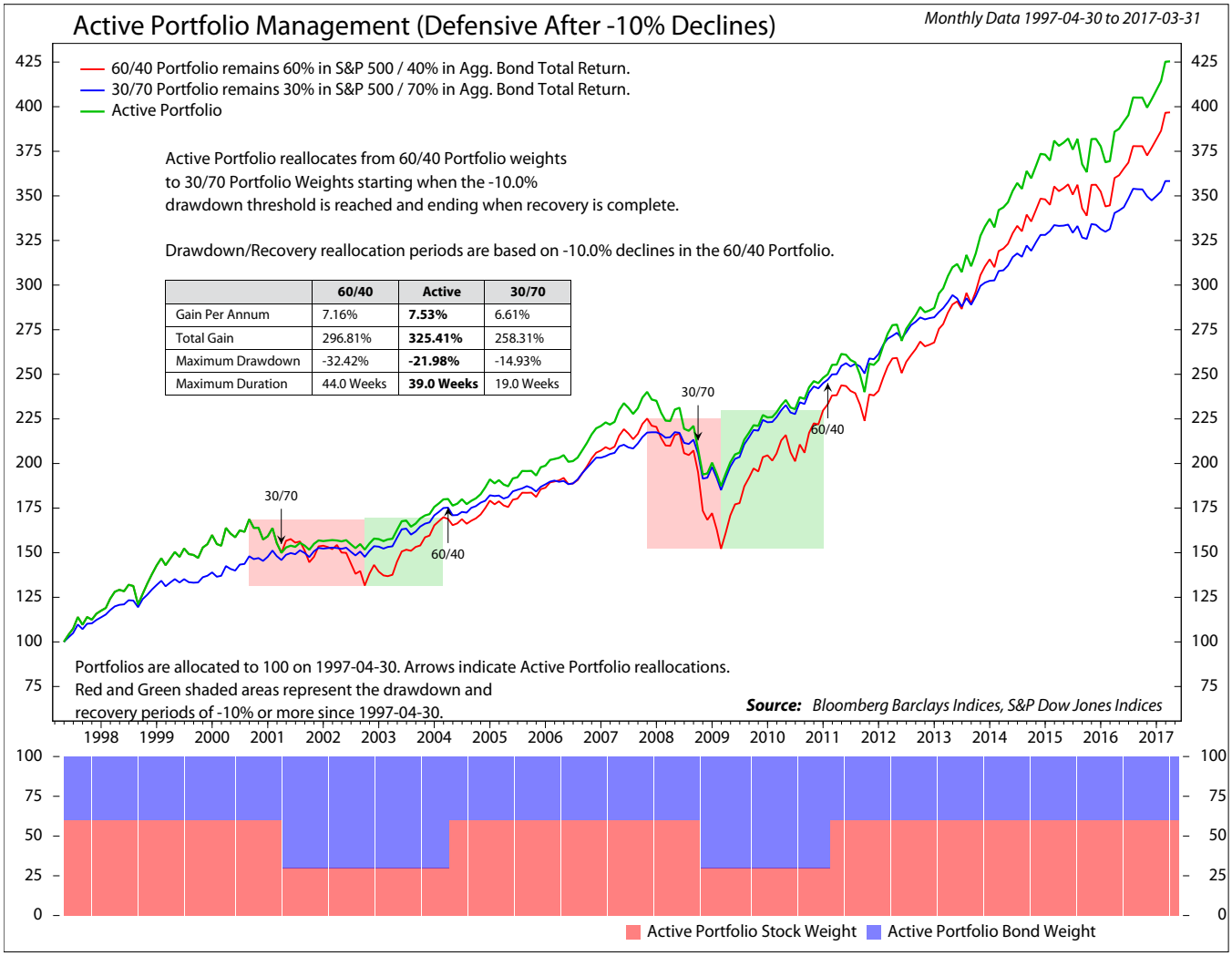
Minimizing risk during large market drops undoubtedly reduces the severity of a portfolio's drawdown. However, during the recovery period, reduced risk typically results in a comparatively sluggish recovery. This implies that a defensive allocation has the potential to hinder long-term gains depending on the duration of the drawdown and the momentum of the recovery.

To better understand this dynamic, we created the chart below showing the change in performance if defensive positions are taken when a portfolio containing stocks and bonds experiences a 10% loss.

The chart below compares three portfolios:

1. **60/40 Portfolio -** a risky portfolio that holds 60% Stocks and 40% Bonds.
2. **30/70 Portfolio -** a defensive portfolio that holds 30% Stocks and 70% Bonds.
3. **Active Portfolio -** an active strategy that reallocates from the 60/40 Portfolio allocation to the 30/70 Portfolio allocation when a 10% loss threshold is met.

The defensive reallocation periods for the "Active Portfolio" are based on the drawdown and recovery periods of the 60/40 Stock/Bond portfolio. To better approximate reality and account for the likely implementation lag, the switch to the defensive allocation begins after the 60/40 portfolio has a 10% drawdown and ends when the 60/40 recovery period is complete. The bottom clip shows the weight allocations of the Active Portfolio. Even with these more conservative assumptions, the portfolio that avoids the large drawdowns via reallocation outperforms both the pure 60/40 and the 30/70 on an absolute basis. Thus, **the chart supports the importance of drawdown reduction strategies to long-term portfolio returns.** NDR provides insights and tools to help advisors actively manage portfolios. For more information, please visit www.ndr.com/advisory.



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